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ABSTRACT

The HyperGLOB project introduced university-level graphic design students to interactive multimedia. This technology involves using the personal computer to display and manipulate a variety of electronic media simultaneously (combining elements of text and speech, music and sound, still images, motion video, and animated graphics) and allows viewers interactive control. The task of each student was to use interactive multimedia to document or express the concept of "freedom," whether personal, social, philosophical, political, or otherwise. The HyperGLOB project required students to work in a collective and collaborative mode, as well as individually. Each student established a hypermedia link between their individual stack and two stacks designed by others. The final result was a large network of convergent ideas. Design factors are discussed in light of their influence on interactivity, presentation structure, and educational objectives. Reproductions of computer screens provide partial examples of student projects. (Author/BEW)

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Paper (M4-201B)

HyperGLOB/Freedom: Preparing Student Designers For a New Media

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Abstract

Having been born into the computer age, today's students will soon be using a full range of multimedia and interactive capabilities to compose, communicate, and illustrate their ideas just as easily as typing or writing a string of words on paper.

The HyperGLOB project introduced university-level graphic design students to a marriage of computers and communication technologies known as "interactive multimedia." This technology allows designers to use the personal computer to display and manipulate a variety of electronic media simultaneously, combining elements of text and speech, music and sound, still-images, motion video and animated graphics. This new media also allows the eventual "viewers" interactive control—a means to determine their own pathways through the material.

The task of each student was to document or express the concept freedom. The topics selected by students covered a variety of issues: personal and philosophic, restrictions on freedom, social bias, institutional factors, political aspects, and so on.

The HyperGLOB project required students to work in a collective and collaborative mode, as well as individually. Each student established a hypermedia link between their individual stack and two stacks designed by other students. The final result was a large network of convergent ideas (assembled into 30+ megabytes of disk space) which suggested the name: HyperGLOB.

"We know that where we perceive no patterns of relationship, no design, we discover no meaning. If the items of information we acquire from news broadcasts, books, and other sources lie around in our minds, unrelated to one another and to our everyday experience, they constitute a pointless and boring miscellany." John Kouwenhoven (1982, p. 208).

Introduction

In addition to news broadcasts or books, information that is digitally processed and delivered via computers is rapidly becoming a common part of our worldwide twenty-first century techno-culture. Today, the medium for instruction, communication and creative work with computers is increasingly multi-sensory—delivering ideas through images, video, sound as well as text.

For printed materials, the responsibility for "constructing communication" has in some part been the domain of graphic designers—the professionals who direct the shape and organization of communications through the careful selection of color, typography, images and other visual characteristics. Like a film director, the designer is invisible and anonymous, yet permeates every nuance of a project. In our daily lives, we are surrounded by the familiar products of graphic designers which might include posters, corporate logomarks, news graphics, magazines, packaging, or signage.

This paper describes a project where university-level graphic design students were introduced to computers that they will later use as professionals to produce conventional printed materials. The HyperGLOB project, however, challenges the students to design a document in the new totally-digital computer-based environment—interactive multimedia—and to apply their concerns for human factors (perception, interpretation, understanding) not to a printed page, but to a computer screen.

Interactive Multimedia

In the middle of this century, electronic media (television) joined paper-based media (printed text and images) as a useful tool for communication, learning and entertainment. In only the past decade, personal computers have entered and transformed these earlier media into a new configuration which has been recently popularized as the "information superhighway."

Perhaps the most comprehensive and complete term for the eventual marriage of computers and communication technologies is "interactive multimedia"—which incorporates its two vital characteristics. "Interactive" suggests the ability of the "viewer" to control the sequence and structure of their experience in the electronic media environment—to determine their own pathways through the material. The best examples of interactivity exploit the "digital" decision-making possibilities of the computer. On the other hand, the most limited uses resemble only a computerized sequential slideshow. The term "multimedia" describes the use of a personal computer to compose, display and manipulate a variety of electronic media simultaneously, combining elements of text and speech, music and sound, still-images, motion video and animated graphics.

For this project, student designers used Apple Macintosh IIcx computers with the software application *HyperCard* (Claris) to design and build a set of interactive multimedia documents. *HyperCard* is a simple software toolkit for the Apple Macintosh computer that allows users to build their own interactive documents (called stacks). The primary function of

HyperCard is to interlink a group of computer screens (called cards) with on-screen "buttons" that can be operated by clicking with a computer mouse.

Project Details

The HyperGLOB project was composed of three phases: an introduction, individual work, and connective work. To orient students to this new media, videotapes of several hypermedia projects were shown and discussed. Other examples were demonstrated during class (see note 1). Next, the students were instructed to design a short *HyperCard* exercise to explore the fundamental operations that they would use to build their larger stacks. After these activities, students spent several more weeks researching, planning, and producing their work.

The core subject matter for the larger HyperGLOB project was the concept freedom. Each student chose a specific topic of interest associated with this broad concept. Their task was to document, to describe, to express, to educate, to a viewer something about that aspect of freedom. Students were cautioned not to become quickly distracted by ideals of American democracy or simple visual symbols of freedom (like an American flag). The topics finally selected by students covered a variety of issues: personal (marriage, family), restrictions on freedom (justice, death penalty), social bias (racism, censorship), institutional factors (religion, state, education), political aspects (Arab-Israeli conflict, Berlin Wall), and so on.

After completing their individual stacks, the final phase of the HyperGLOB project required students to work in a collective and collaborative mode. Each student was asked to establish a hypermedia link between their individual stack and two stacks designed by other students. To accomplish this, they developed an intermediate series of cards to act as an intellectual and visual bridge between ideas, trying to create a seamless continuity. The challenge of this phase was to exploit the potential of *HyperCard* for building non-linear sequences of ideas that branch and interconnect. The final result (see note 2) was a large network of convergent ideas (assembled into 30+ megabytes of disk space) which suggested the name: HyperGLOB.

The HyperGLOB project demonstrates that an advanced computer system is not needed to begin exploring the fundamentals of interactive multimedia, and that with the user-friendly software program *HyperCard*, novice students can quickly produce sophisticated projects working individually or in teams. Also, the basic methods are easily transferable to any subject matter or academic level and can engage individual students or the class as a whole.

One student, after working to integrate his stack with others, observed that, "People have totally different ways of laying out their ideas than the way you lay out yours. Different type styles, images, cropping, even the vocabulary is different." This statement contains the essence of the HyperGLOB project. By working to integrate their individual stacks (both visually and intellectually) with the larger group, students struggled with the same dynamics present in many other situations, such as the responsibilities of the individual to society.

The Issue of Freedom

Freedom is an enduring human question. The modern notion of naturally-endowed freedoms can be traced to the thinkers of the French Enlightenment and the American Revolution (Rousseau, 1984; Paine, 1921). They philosophize that the world, in its natural state, is a chaotic and savage place. In such a world, you are free to exercise any of the abilities endowed to you as a human being. For example, you are absolutely enabled to reap destruction upon your neighbor. However, if you do not want your neighbors to execute their equal ability of destruction upon you, you can construct a pact—or in Rousseau's term, a social contract. To gain security and order, you must sacrifice some primal aspect of your being. Every right is balanced with a corresponding responsibility.

One modern example is our system of traffic signals. There is no actual barrier to driving your car speeding through a red light. What prevents you is a system of social constructs, derived from a desire for self-preservation and personal security. You gladly sacrifice your original ability to drive wherever and whenever you want for some guarantee that others will do the same. The question of freedom—personal expression versus common cause—is encountered and resolved by everyone in a multitude of everyday decisions.

By addressing the general question of freedom, the HyperGLOB project provokes students to consider parallel ideas about the relationship of freedom to the underlying nature of hypermedia, to the practice of graphic design, and finally to their own lives.

The nature of hypermedia itself demands interactivity—flexibility within structure, non-linearity, and choice. Like the dynamic balance of rights and responsibilities, a complete lack of structure will result in chaos—a glut of randomly-distributed and fragmented ideas rather than a larger body of useful knowledge. In contrast, too much programmed structure yields continuous but predetermined patterns.

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This question of freedom is also a relevant philosophic issue for graphic designers. The fundamental challenge of graphic design is creativity within compromise. Unlike the fine artist who exhibits artwork framed and purified from the world in a white-walled gallery, the graphic designer must incorporate their work with, not abstract it from, the context of the world. To design a corporate logomark, for example, that does not consider other competitor's symbols or the intended audience is not good design. Like the social contract between the individual and society, graphic designers must be able to establish compromise with their client—creativity within context.

Finally, the students themselves are in a stage of personal transition. They are seeking and establishing a new structure for their lives as adults, independent from parents and the security of home. Perhaps the HyperGLOB project can slightly stir into consciousness some latent awareness of these problems of freedom and connect to the personal experiences of the students.

Design Factors and Observations

As with any design project, the final critique is a time of critical review where common problems are clarified and individual innovation is highlighted. The HyperGLOB project review reaffirmed several visual design principles:

- The basic formal principles of design (like balance, pattern, proportion) still apply to composition of a computer screen. For example, information should not be stuffed onto a card from "wall-to-wall." Sometimes the negative space of a composition is as useful as the positive space to create dramatic images.

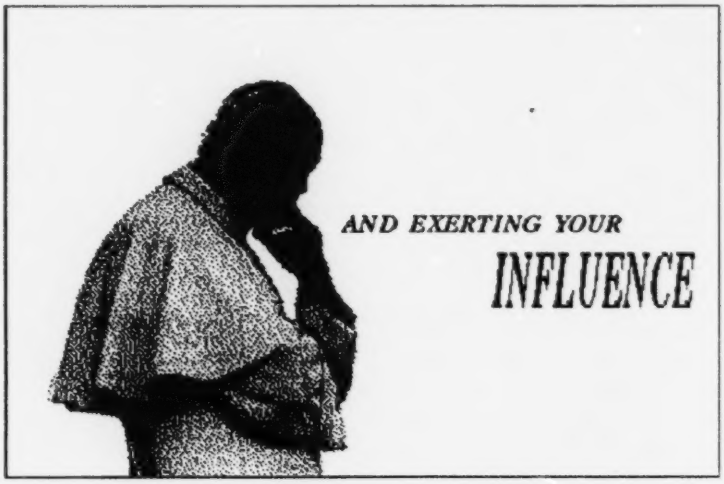

Figure 1. An example of "active" white space. (Scott Gerber).

- Attention to typography, the arrangement of letterforms for expression and organization, also remains a factor. Although the computer screen does not hold the same quality and resolution as a printed page, this should not distract the designer from demanding well-spaced typography within the limits of the video display. Computers do not automatically place and space letters equally without error. Proper letterspacing must finally be judged by the human eye, not numerical measurements.

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Figure 2. Typographic details are important. Notice the gap between the N and T, and the improved letterspace below.

- The amount of text on any one screen should be limited to short simple phrases. Due to the low resolution of the computer display, small letters break apart and become illegible. Moreover, users interact at a pace too rapid for reading—a pace closely related to watching television where communication occurs instantaneously through images and sounds.

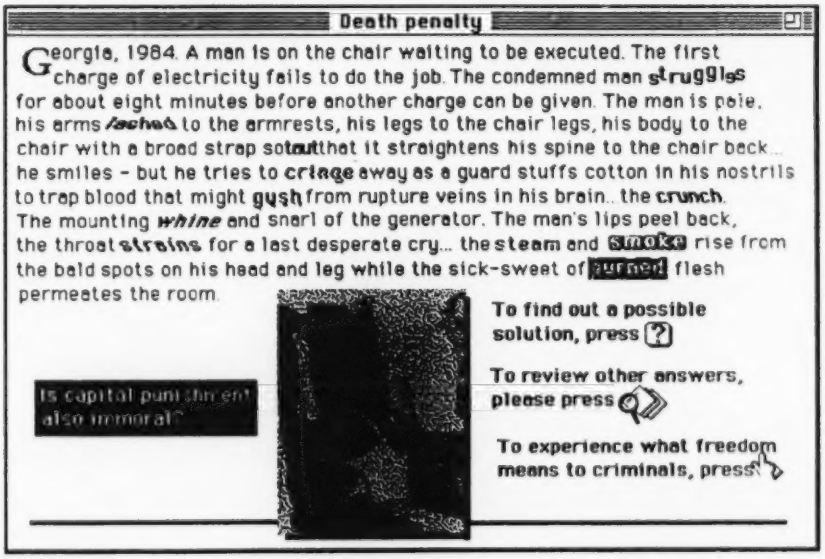
Death penalty
Georgia, 1984. A man is on the chair waiting to be executed. The first charge of electricity fails to do the job. The condemned man struggles for about eight minutes before another charge can be given. The man is pale, his arms lashed to the armrests, his legs to the chair legs, his body to the chair with a broad strap so taut that it straightens his spine to the chair back... he smiles - but he tries to cringe away as a guard stuffs cotton in his nostrils to trap blood that might gush from rupture veins in his brain... the crunch. The mounting whine and snarl of the generator. The man's lips peel back, the throat strains for a last desperate cry... the steam and smoke rise from the bald spots on his head and leg while the sick-sweet of burned flesh permeates the room.
Is capital punishment also immoral?
To find out a possible solution, press ?
To review other answers, please press
To experience what freedom means to criminals, press

Figure 3. Excessive text can be hard to read. Can it instead be expressed with sound or images? (Jorge Naranjo).

Multimedia

In this new media, ideas can be expressed using a variety of sensory and cognitive modes: text, drawings, photographic images, animation, sounds, voice, music, or any combination thereof. Good "multimedia" will take advantage of the inherent qualities of each mode to more completely express an idea or concept.

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For example, a tea kettle can be more robustly understood not only through its image, but also through a few clearly recognizable sounds—the whistle, or the clang of the metal container. Sometimes sound is simply used to develop context—a general atmosphere. In one student *HyperCard* stack, synchronized sound is used to punctuate a sequence of animation and later a deep grinding pulse is used to reflect the industrial rhythm of machinery, power, and infrastructure, which all relate to the content of the stack.

Graphic designers seem particularly suited for tasks, like creating multimedia, that involve the integration of various elements. Essential to their practice, even in the design of printed material, is a close interrelationship between word and image (verbal and visual modes of communication).

Interactivity and Structure

In *HyperCard*, buttons are the active areas of the screen that allow the user to jump from card to card by clicking on them with a mouse. Students demonstrated two strategies for interfacing buttons to cards. One strategy has the buttons clearly set apart from the background images, like the controls on television set. The second strategy is to locate the button transparently within the images of the card and position them according to concentrated areas of attention. The composition of the card usually suggests one or two visually-logical focal points.

Figure 4. The eyes are a visually logical button position. (Christy Vaughan).

While using buttons to move through a series of cards, the user should develop a sense of continuity between cards, not the sense of a disconnected and fractured pathway. Students echoed visual elements from card to card, and carefully programmed visual transitions to respond to the visual composition of a screen. For example, a card containing the image of a landscape would blend to the next card with a horizontal transition effect.

To outline the sequence and structure of their stacks, many students first sketched a diagram that resembled a flowchart or a movie storyboard. The underlying pathways of individual stacks were arranged in a variety of structures: one central card with spokes radiating to other cards like a wheel, or a main trunk and branches like a tree, and some were nearly straight linear slideshows—an uninterrupted sequence of cards with little user control.

Educational Objectives

The technical goal of the HyperGLOB project was to introduce novice students to simple Macintosh computer operating skills (e.g. cut, paste, save) and basic graphics ideas (e.g. bitmap painting, importing graphics, scanning) that will transfer to other class projects.

A higher-order goal of the project, as noted previously, was to stimulate thinking about the concept of freedom and its relationship to hypermedia, design, and the personal lives of the students.

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Finally, the HyperGLOB project was able to engage students in a constructive and collaborative system of classroom learning where individual expression becomes nested in a larger network of ideas. This simulates the professional challenges that they will encounter as practicing designers in our society.

HyperGLOB Examples

The following examples describe several of the individual stacks produced by students, and are accompanied by illustrations.

- Decisions (Tracy McCotter): This stack examines the social influences that shape our individual decisions—friends, government, society, family, and even your pet dog. If the user tries to escape these "outside influences" then a digitized voice of Orwellian tone proclaims: "It is useless to resist us."

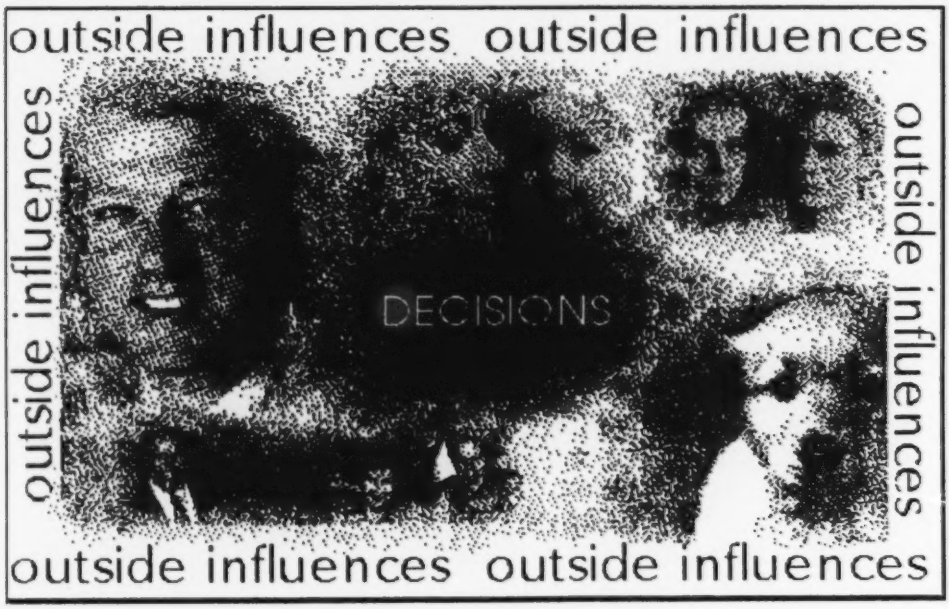

Figure 5. Tracy McCotter.

- Religion (Elizabeth Montgomery): Reacting to the personal experience of growing up in a combined Jewish and Christian household, this student questions how we come to acquire our particular religious faiths. Her stack associates imagery from modern-day evangelism to ancient rites.

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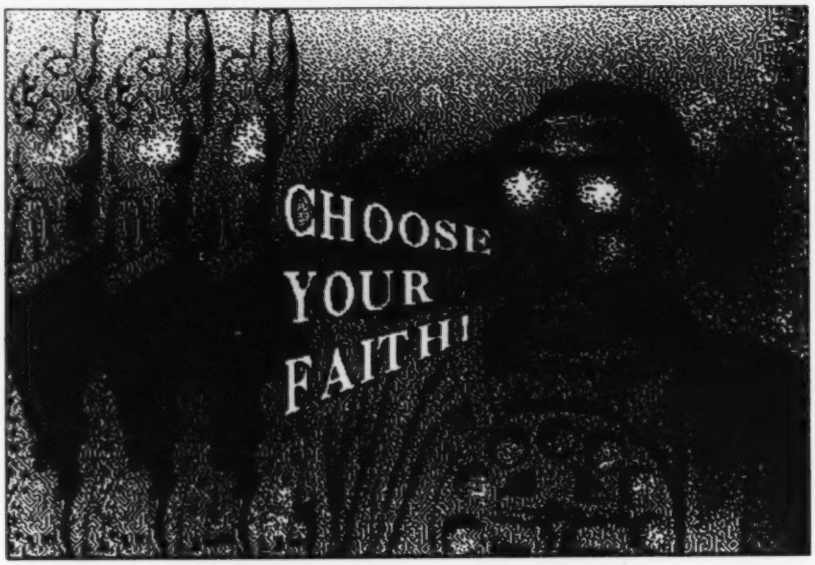

Figure 6. Elizabeth Montgomery.

- Details (Juli Summers): By interacting with a street scene of store-front windows, the user can browse through a world of funky fashion and expressive styles. After clicking on a doorway, the user can enter and browse through a series of shops like Cucorachas, a good-time coffeehouse infested by one giant cockroach.

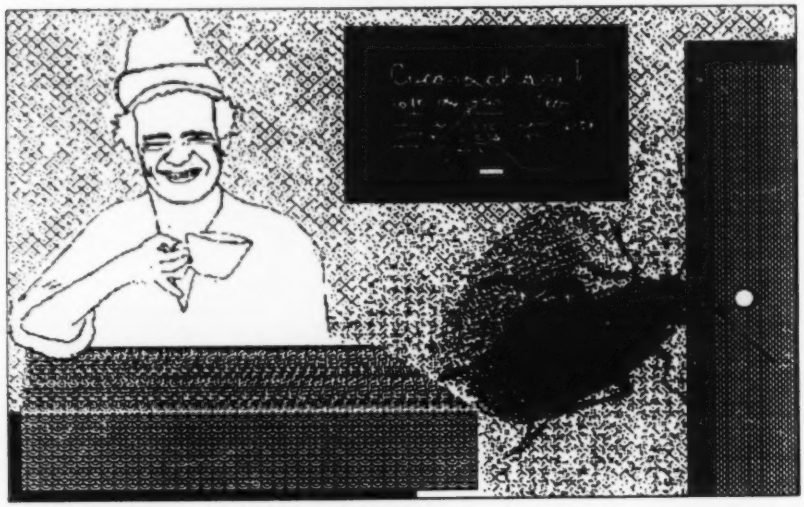

Figure 7. Juli Summers.

Conclusion

One student remarked that the most interesting aspect of the HyperGLOB project was "...being introduced to something so contemporary, almost a taste of the future." These students, having been born into the computer age and not adopted by it, can sense the coming revolutionary merger of technology, communication and culture that will occur during their

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generation. By the time these students become active citizens, the technologies of voice recognition, pen-based computing, intelligent systems, virtual reality simulations, cooperative telecomputing will be the norm.

As the digital web of world-wide information expands, with clusters connecting and layers building, some design students may recognize that the shape of the new media network resembles their HyperGLOB project. In turn, their investigations with HyperGLOB on a smaller scale may suggest what strategies to maintain from their old ways of working in print design, and what new challenges they must overcome as the constructors of a new communications environment.

These students will become the practicing professionals of the twenty-first century. How we nurture their intelligence, vision, and design sense in our classrooms today, will determine if they compose something more than "...a pointless and boring miscellany..." from the elements of this new media.

Note 1. Examples from an older version of the HyperGLOB project were shown on videotape to the students. This older project took human communication, not freedom, as the core subject matter. Also shown was A Memory Project by Henry See, a Canadian hypermedia artist. Hands-on examples included two hypermedia project stored on CD-ROM: Beethoven's Fifth Symphony (Voyager), and Cosmic Osmo (Cyan).

Note 2. After connecting of the first mass of *HyperCard* stacks into a HyperGLOB, the project was repeated with another group of students who were required to integrate their work with the students from the earlier semester. Thus, the HyperGLOB project continued to grow into an even greater interwoven network responding to the core idea of freedom.

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